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positarum forms occurring with the uredo of *Puccinia tanaceti*, closely followed by the teleutospores. The same *Æcidium* occurs on all five, and is invariably followed, if not accompanied, by the uredo and teleutospores of this fungus.

PHRAGMIDIUM SUBCORTICIUM occurs, sometimes to an alarming extent, on *Rosa Arkansana*, *Rosa blanda* (?), and *Rosa Sayi*. No doubt it would do serious damage to cultivated roses in certain localities. At Helena in 1887 I found several cultivated varieties more or less affected by the *æcidium* of this fungus. On the wild roses the uredo and teleutospores do serious injury, some years destroying the leaves.

MELAMPSORA SALICIS is found on nearly all our Willows. I have found it abundantly on *Salix longifolia*, *S. cordata*, *S. amygdaloides*, *S. rostrata*, *S. flavescens*, and *S. glauca*. It appears to be most injurious to *Salix cordata* and *Salix flavescens*. Sometimes in the early fall great clouds of the red uredospores are blown from the trees, sprinkling the vegetation for some distance around. Last year this *Melampsora* was unusually prevalent and vigorous in its attacks. I found it both sides of the main divide of the Rocky Mountains, from the southern border of the Territory and the source of Clarke's Fork of the Columbia River and the source of the Missouri River, thence northeastward to within fifty miles of the Canadian line. Good sized trees in some localities were almost entirely defoliated. On the banks of the Upper Missouri, in one locality, were found in September several hundred acres of seedlings of *Salix amygdaloides* and *Salix cordata*, then from 3 to 6 inches high and as close as grass, which were probably permanently ruined by the uredo of *Melampsora salicis*. The leaves, especially the lower ones, had all fallen from the effect of the parasite and were decaying. The upper leaves were almost devoid of chlorophyll and evidently perishing.

MELAMPSORA POPULINA, like the last, was very abundant last year and did considerable damage to *Populus tremuloides* and *P. angustifolia*. I also found it on *P. monilifera*, *P. balsamifera*, and *P. angulata* more sparingly.

MELAMPSORA LINI some seasons is ruinous to *Linum rigidum*, and also sharply attacks *Linum Lewisii* (commonly called *L. perenne* by western collectors). *Linum Lewisii* is rather similar to the cultivated flax, and if the latter were introduced it would doubtless suffer more or less from this fungus.

SPOTTING OF PEACHES.

By ERWIN F. SMITH.

A recent paper on this subject by Dr. J. C. Arthur (Bull. Agr. Exp. Sta., Indiana, No. 19, 1889) leads to the following remarks:

Cladosporium carpophilum, v. Thümen is undoubtedly the conidial stage of some well-known ascomycetous fungus. It occurs on the leaves as well as the fruit, and I think also on the branches. It is by no means confined to Indiana, or rare in any peach district in the United States. It is common along the Atlantic, in the region of the Great Lakes, in the Lower Mississippi Valley, and in California. In Maryland and Delaware it has been known for many years, and is so abundant that its presence is regarded as a matter of course. The choice early peaches and the middle varieties are little subject to it, but Smocks and nearly all late and inferior sorts are more or less spotted. So constant is this spotting that many peach-growers have come to consider it as *characteristic* of certain varieties and have no idea that it is abnormal.

It injures the appearance of the fruit somewhat, and when very abundant the flavor also, unless I have been much deceived. Growers do not generally regard it as a serious evil, or indeed as a matter of any consequence. The loss in late sorts with firm flesh is nevertheless sometimes very considerable. So far as my own observation goes this results principally from cracking and rot, in much the same way as in apples and pears when badly attacked by *Fusicladium.* The half-grown peach forms a protective layer of cork beneath the most thickly spotted surface. This cork layer is incapable of further growth and is ruptured in deep irregular fissures when the peach rapidly enlarges during the last few days of its growth. The spores of *Monilia fructigena* Pers. fall upon this exposed surface and rot begins immediately. The cracking appears to be worse in rainy weather, which is also the most favorable condition for the rapid development of the rot. In September, 1888, in the great peach region of Maryland and Delaware (the north part of the peninsula) fully one-half of the Smock peaches, aggregating many thousand baskets, were lost by rot during a rainy week. Cracking of the fruit often preceded this rot and was due in part to *Cladosporium.* Nevertheless the loss would have been inconsiderable but for the presence of this other much worse parasite—the rot fungus.

In 1886 and 1887, two very rainy seasons *Cladosporium carpophilum* was abundant in Maryland and Delaware, and I am therefore inclined to think that dry seasons are not specially favorable to its growth.

EXPERIMENTS IN THE TREATMENT OF GOOSEBERRY MILDEW AND APPLE SCAB.

Prof. E. S. Goff, of the New York Experiment Station, has kindly furnished us with the results of his experiments in the treatment of these diseases in 1888, which we give in full below:

POTASSIUM SULPHIDE FOR THE GOOSEBERRY MILDEW.

At the suggestion of Dr. J. C. Arthur,* formerly botanist to the

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* For results secured with this substance by Dr. Arthur in 1887, see Report New York Agricultural Experiment Station, 1887, pp. 248-252.